# UNITED STATES PATENT AND TRADEMARK OFFICE

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| 09/458,139 | 12/09/1999 | YI-MIN WANG | 200730 | 8486 |

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| 2126 | |

DATE MAILED: 10/30/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1) ☒ Responsive to communication(s) filed on *30 January 2001* .

2a) ☐ This action is **FINAL**.          2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
   closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4) ☒ Claim(s) *1-46* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-46* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

## Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All  b) ☐ Some * c) ☐ None of:

    1. ☐ Certified copies of the priority documents have been received.

    2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

    3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
       application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

1) ☒ Notice of References Cited (PTO-892)          4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)          5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .          6) ☐ Other: .

## DETAILED ACTION

### Double Patenting

1.      The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).
        A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).
        Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2.      Claims 8 – 13 and 31 – 36 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable respectively over claims 1 – 6 and 7 – 12 of copending Application No. 09/458240 (hereinafter '240) in view of Madukkarumukumana and VIA. Claims 8 and 31 are met by the corresponding claims 1 and 7 of '240 except for the limitations of claims 1 and 24 from which 8 and 31 depends. The limitations of claims 1 and 24 are taught by Madukkarumukumana and VIA, see the rejection of claims 1 and 24 below.

        This is a <u>provisional</u> obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

3.      Claims 1 – 23 and 24 – 46 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 8 – 30, and 38 – 60 of copending Application No. 09/458138 (hereinafter '138).

As to claims 1 and 24, '138 teaches "communication between a first object...and

a second object located on a second computer...connected by a network" (claim 1, lines

1 – 4 of '138), "accessed by the first computer through a network interface card on the

first computer" (claim 8, lines 2 – 3 of '138), "calling an interface...with the first object"

(claim 1, lines 5 of '138), "placing in the buffer...reading the first parameter out of the

first memory location" (claim 8, lines 3 – 8 of '138).

Claims 2 – 23 and 25 – 46 are met by claims 9 – 30 and 39 – 60 of '138.

This is a <u>provisional</u> obviousness-type double patenting rejection because the

conflicting claims have not in fact been patented.

### *Claim Rejections - 35 USC § 103*

4.      The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

5.      Claims 1, 2, 4, 5, 14 – 18, 24, 25, 27, 28, and 37 – 41 are rejected under 35

U.S.C. 103(a) as being unpatentable over "Harnessing User-Level Networking

Architectures for Distributed Object Computing over High-Speed Networks" (hereinafter

Madukkarumukumana) in view of "Virtual Interface Architecture Specification, Revision

1.0" (hereinafter VIA).

As to claim 1, Madukkarumukumana teaches (p. 5, Section 4.2 Anatomy of

Custom Stub/Proxy; p. 2, Section 2. Virtual Interface Architecture) a method of

communication (p. 4, Section 4. DCOM Remote Method Invocation over VI Architecture

Transport) between a first object (custom proxy) on a first computer (client

process/machine) and a second object (custom stub) on a second computer (server

process/machine), the computers connected by a network (VI Architecture is a user-

level networking architecture, Section 2. Virtual Interface Architecture, p. 2), and calling

an interface of the second object with the first object (user-level VI transport for inter-

process communications, Fig. 5). Madukkarumukumana does not describe the

transmission process in detail.

However, VIA teaches (p. 12 – 13, Section 2.1.1. Virtual Interfaces) placing in the

buffer (send queue) a copy of a first pointer (Descriptor is a data structure that contains

all of the information that the VI Provider needs to process the request, such as pointers

to the data buffers) to a first parameter (data stored in the data buffers), the network

interface card transmitting the first parameter pointed to by the first pointer by reading

the first parameter out of the first memory location (VI NIC directly performs data

transfer functions).

It would have been obvious to apply placing in the buffer a copy of a first pointer

to a first parameter, transmitting the first parameter by the network interface card as

taught by VIA to the invention of Madukkarumukumana because it would avoid

intermediate copies of the data and bypasses operating system to achieve low latency,

high bandwidth data transfer (p. 2, Section 2. Virtual Interface Architecture of

Madukkarumukumana).

As to claim 24, this is a product claim that corresponds to method claim 1; note

the rejection of claim 1 above, which also meets this product claim.

As to claims 2 and 25, Madukkarumukumana as modified teaches (p. 15, first paragraph of VIA) issuing a notification on the first computer after the network interface card has finished reading the first parameter out of the first memory location (the Send/Receive model of data transfer requires that the VI Consumers be notified of Descriptor completion at both ends of the transfer).

As to claims 4 and 27, these claims are drawn to placing one or more pointers in the buffer and the network interface card transmitting the parameters that the pointers point to. Madukkarumukumana as modified teaches the buffer (send queue, p. 10 of VIA) contains one or more pointers (Descriptors that describe the data to be transmitted, p. 10 of VIA) and asynchronously processing the posted Descriptors (p. 13 of VIA).

As to claims 5 and 28, these claims are drawn to issuing a notification on the sending computer each time the network interface card has finished reading a parameter. Madukkarumukumana as modified teaches (p. 15, first paragraph of VIA) the Send/Receive model of data transfer requires that the VI Consumers be notified of Descriptor completion at both ends of the transfer.

As to claim 14, Madukkarumukumana teaches (p. 5, Section 4.2 Anatomy of Custom Stub/Proxy; p. 2, Section 2. Virtual Interface Architecture) a method of communication between (p. 4, Section 4. DCOM Remote Method Invocation over VI Architecture Transport) a first object (custom proxy) located on a first computer (client process/machine) and a second object (custom stub) located on a second computer (server process/machine), the first and second computers connected by a network (VI

Architecture is a user-level networking architecture, Section 2. Virtual Interface

Architecture, p. 2), and receiving a call from the first object on an interface of the second

object (user-level VI transport for inter-process communications, Fig. 5), and accessing

the parameter by the second object (interface stub unmarshals method parameters from

receive buffers and dispatches actual object methods). Madukkarumukumana does not

describe the receiving process in detail.

However, VIA teaches (p. 12 – 13, Section 2.1.1. Virtual Interfaces) receiving by

the network card a parameter of the call from the first object (VI NIC directly performs

data transfer functions), and storing the parameter in a memory location (receive queue

contains Descriptors that describe where to place incoming data, p. 10).

It would have been obvious to apply receiving by the network card a parameter of

the call from the first object, and storing the parameter in a memory location as taught

by VIA to the invention of Madukkarumukumana because it would bypass operating

system to achieve low latency, high bandwidth data transfer (p. 2, Section 2. Virtual

Interface Architecture of Madukkarumukumana).

As to claim 37, this is a product claim that corresponds to method claim 14; note

the rejection of claim 14 above, which also meets this product claim.

As to claims 15, 16, 38, and 39, Madukkarumukumana teaches that the memory

location is the buffer and accessing the parameter is performed in the buffer (each

interface stub unmarshals method parameters from receive buffers, p. 5, Section 4.2 of

Madukkarumukumana).

As to claims 17, 18, 40, and 41, Madukkarumukumana as modified teaches the memory location is the memory storage location (physical memory) and accessing the parameter in the memory storage location (locking the pages of a virtually contiguous memory region into physical memory, Section 2.2, p. 14 of VIA).

6.      Claims 3, 6, 7, 26, 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Madukkarumukumana and VIA in view of U.S. Patent No. 6,131,126 to Kougiouris.

As to claims 3, 6, 7, 26, 29, 30, Madukkarumukumana as modified teaches reclaiming memory (reuse registered memory buffers, Section 2.2, p. 14 of VIA) but does not specify reclaiming the memory location after receiving the notification.

However, Kougiouris teaches (column 2, lines 28 – 45) a method in a computer system for inter-process communication that reclaims a memory location after data transmission (the first buffer is deallocated upon receipt of the communication).

It would have been obvious to apply the teaching of reclaiming a memory location after data transmission as taught by Kougiouris to the invention of Madukkarumukumana as modified because this prevents large and unnecessary consumption of memory resources.

7.      Claims 8, 13, 19, 20, 31, 36, 42, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Madukkarumukumana and VIA further in view of U.S. Patent No. 6,044,409 to Lim.

As to claims 8, 13, 31, and 36, Madukkarumukumana as modified teaches a receive buffer (VI Consumer at the receiving end pre-posts a Descriptor to the receive

queue, first paragraph, p. 15 of VIA) but does not specify posting on the first computer a

first receive buffer prior to sending a first data to the second computer.

However, Lim teaches (column 12, lines 19 – 25, 55 – 60, and 64 – 66) posting

on the first computer a first receive buffer prior to sending a first data to the second

computer (a marshal buffer appropriate for the transport selected is created in step 206,

Fig. 4), the first receive buffer will receive a second data from the second computer in

response to the first data (the client receives a reply from the server and encapsulates

the reply in a marshal buffer 216 and 218, Fig. 4), and sending the first data to the

second computer (the contents of the marshal buffer are transmitted over the selected

transport to the identified end point 212, Fig. 4).

It would have been obvious to apply the teaching of posting on the first computer

a first receive buffer prior to sending a first data to the second computer as taught by

Lim to the invention of Madukkarumukumana as modified because this would ensure

that there is memory available to store the response data.

As to claims 19 and 42, Madukkarumukumana as modified teaches storing on

the second computer a second data into a first receive buffer (marshals return

parameters into the reply buffers, Section 4.2, p. 5 of Madukkarumukumana). As to

posting a receive buffer prior to sending data to a computer, see the rejection to claims

8 and 13 above.

As to claims 20 and 43, Madukkarumukumana as modified teaches (column 12,

lines 55 – 67 of Lim) the first data from a send buffer to the first computer was sent

(transmit contents of marshal buffer over selected transport to identified end point 212,

Fig. 4) prior to receiving the second data form the first computer (receive reply from

server 216, Fig. 4).

8.      Claims 9 – 12 and 21 – 22 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Madukkarumukumana, VIA and Lim further in view of Kougiouris.

As to claims 9, 11, 21, 23, 32, 34, 44, and 46, these claims are drawn to cleaning

up a buffer on a computer after the data from the buffer has been transmitted.  Note the

rejection of claims 3, 6, 7, 26, 29, and 30 above.

As to claims 10 and 33, these claims are drawn to posting a receive buffer prior

to data transmission.  See the rejection to claims 8, 13, 31, and 36 above.

As to claims 12, 22, 35, and 45, Madukkarumukumana as modified teaches

using a send buffer to send data to a computer (transfer data directly between buffers of

a VI Consumer and the network, Section 2.2, p. 14 of VIA).

## *Conclusion*

9.      Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Li B. Zhen whose telephone number is (703) 305-3406.

The examiner can normally be reached on Mon - Fri, 8am - 4:30pm.

The fax phone numbers for the organization where this application or proceeding

is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for

After Final communications.

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is (703) 305-

3900.

Li B. Zhen
Examiner
Art Unit 2126

lbz
October 16, 2002

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